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METHOD AND APPARATUS FOR CHARACTERIZATION OF OPTICAL SYSTEMS

ABSTRACT OF THE DISCLOSURE

Characterization of an optical system is quickly and easily obtained in a single acquisition step by obtaining image data within a volume of image space. A reticle and image plane are positioned obliquely with respect to each other such that a reticle having a plurality of feature sets thereon, including periodic patterns or gratings, is imaged in a volume of space, including the depth of focus. Metrology tools are used to analyze the detected or recorded image in the volume of space through the depth of focus in a single step or exposure to determine the imaging characteristics of an optical system. Focus, field curvature, astigmatism, spherical, coma, and/or focal plane deviations may be determined. The present invention is particularly applicable to semiconductor manufacturing and photolithographic techniques used therein, and is able to quickly characterize an optical system in a single exposure with dramatically increased data quality and continuous coverage of the full parameter space.